

Natural Resources Conservation Service

**Agricultural Engineer
Career Guide**

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Introduction

NRCS Career Mapping

These Career Maps will allow incumbents to identify the steps needed to qualify for higher-level positions in their current career group. Each career map has a career guide that will provide sample training and developmental activities needed to meet competency gaps between the incumbent's current position and his or her desired position. In addition, these maps will be used for recruitment purposes, explaining what a candidate needs to qualify for various positions.

Each occupation's Career Guide will include:

- A list of competencies with proficiency ratings identified for each position
- A sample list of training and experiential activities that are linked to developing each competency
- Clear guidance about how positions relate to each other

Together, these elements will help inform NRCS employees' and candidates' decisions about their careers at NRCS.

The purpose of this document is to provide an overview of the knowledge area requirements and associated training and developmental experiences associated with each position in the Engineering career group. The Career Guides are not intended to be all encompassing, but rather to give users an overview and snapshot of each job within NRCS.

Career Group Description

This is an overall description of the career group.

Table 2. Engineering Career Group Description

Description
These positions are responsible for the planning, design, and construction of engineering works of improvement for any conservation activities taken on by NRCS. These positions require the application of sound engineering principles. This includes adapting proven methods and procedures, as well as devising new design procedures incorporating the latest technological advances in conservation engineering.

Jobs within Engineering

Table 3. Job Titles within Engineering

OPM Series Code	Job Title
0802	Civil Engineering Technician
0810	Civil Engineer
0819	Environmental Engineer
0890	Agricultural Engineer
0801	Assistant State Conservationist - Operations

This is a description of any internship program NRCS offers that prepares individuals for hiring into this career group.

Table 4. Engineering Intern Description

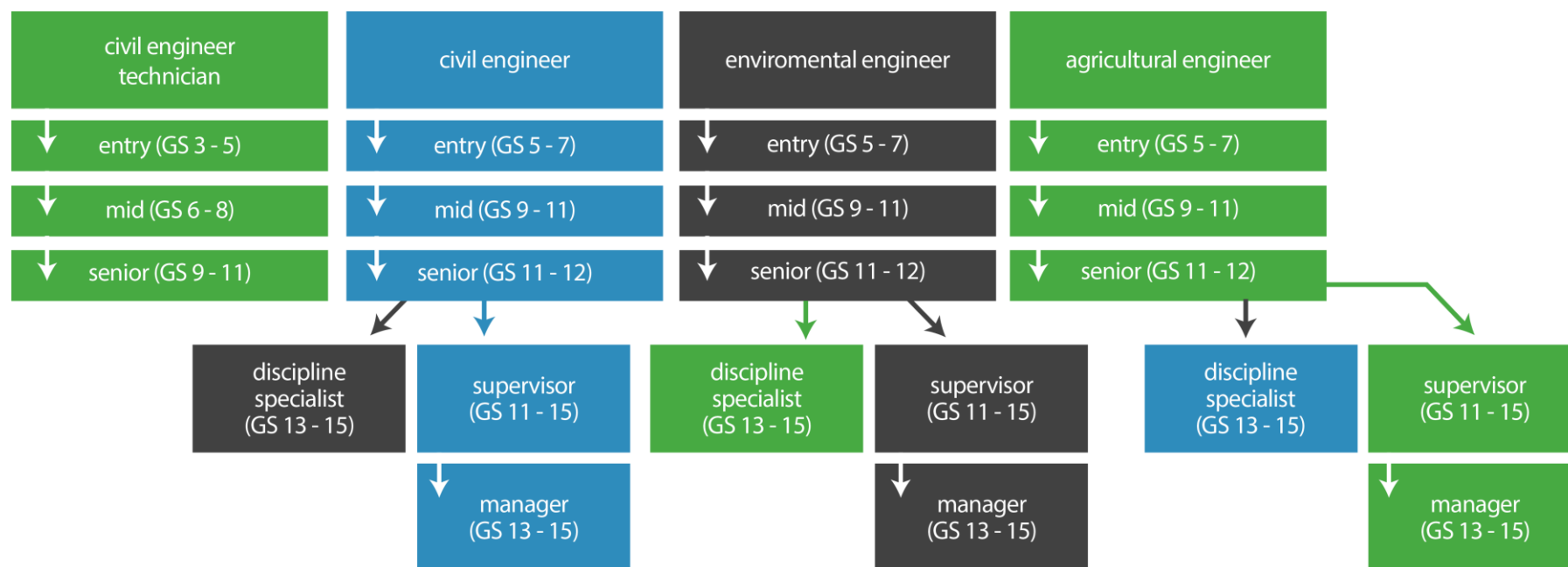
The incumbent serves as an engineer trainee and assistant. The trainee learns to assist in overall planning, design, installation, and maintenance of the engineering phases of soil and water conservation practices.
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Crosswalk of Career Levels to the General Schedule

This table reflects the General Schedule (GS) levels associated with the individual Career Level labels. Definitions of the Career Levels are included in the Appendix.

Table 5. GS by Career Level

Job	Entry	Mid	Senior	Dis Spec	Sup	Mgr
Civil Engineering Technician	GS 3-5	GS 6-8	GS 9-11			
Civil Engineer	GS 5-7	GS 9-11	GS 11-12	GS 13-15	GS 11-15	GS 13-15
Environmental Engineer	GS 5-7	GS 9-11	GS 11-12	GS 13-15	GS 11-15	GS 13-15
Agricultural Engineer	GS 5-7	GS 9-11	GS 11-12	GS 13-15	GS 11-15	GS 13-15



Engineering Job Descriptions

This is a general overview of each Engineering job, intended to provide a common framework for describing what the job is.

Table 6. Engineering Job Descriptions

Job	Description
Civil Engineering Technician	This person provides engineering assistance, working with landowners, groups, and units of government to apply and maintain a variety of conservation practices. This job also includes the responsibility of designing engineering practices, preparing engineering drawings, computing quantities, and preparing cost estimates. This position does not require an engineering degree.
Civil Engineer	This person provides engineering assistance, working with landowners, groups, and units of government to apply and maintain a variety of conservation practices. This person is responsible for providing technical guidance and the overall planning, design, installation, and maintenance of the civil engineering phases of conservation activities.
Environmental Engineer	This person provides engineering assistance, working with landowners, groups, and units of government to apply and maintain a variety of conservation practices. This person is responsible for providing technical guidance and the overall planning, design, installation, and maintenance of the environmental engineering phases of conservation activities.
Agricultural Engineer	This person provides engineering assistance, working with landowners, groups, and units of government to apply and maintain a variety of conservation practices. This person is responsible for providing technical guidance and the overall planning, design, installation, and maintenance of the agricultural engineering phases of conservation activities.

Job	Description
Assistant State Conservationist - Operations	This person manages and directs functions involved in planning, organizing, and implementing a comprehensive soil, water, engineering, and resource conservation and development program for the state. The incumbent of this position has responsibility for operations and internal controls.

Overall Engineering Job Duties

These are three major duties associated with all Career Levels in a job.

Table 7. Overall Engineering Job Duties

Job	Duty 1	Duty 2	Duty 3
Civil Engineering Technician	Conducts planning and data collection	Conducts analysis and design	Performs quality assurance of conservation practices
Civil Engineer	Conducts planning and data collection	Conducts analysis and design	Performs quality assurance of conservation practices
Environmental Engineer	Conducts planning and data collection	Conducts analysis and design	Performs quality assurance of conservation practices
Agricultural Engineer	Conducts planning and data collection	Conducts analysis and design	Performs quality assurance of conservation practices
Assistant State Conservationist - Operations	Formulates and establishes the State natural resource conservation policies and programs based on broad national agency objectives	Develops and implements a system of operational and program assessments and reviews to evaluate effectiveness of conservation planning and practices	Develops and maintains effective working relationships with the conservation districts and the State-level natural resources agencies

Specifics by Job – Agricultural Engineer

Job Duties by Career Level – Agricultural Engineer

These are three major duties associated with the individual Career Levels for the Agricultural Engineer job. In general, these are slight deviations of the Overall Duties, intended to show the differences in responsibility between the Career Levels.

**Table 33. Career Level Duties –
Agricultural Engineer**

Job Duty	Entry	Mid	Senior	Dis Spec	Sup	Mgr
Performs site investigations, survey work, CAD work, and data collection	✓					
Prepares and reviews engineering designs and reports which includes design calculations and plan preparation	✓					
Performs quality assurance to ensure that projects are carried out as designed and recommends additions as needed	✓					
Performs, trains, and provides guidance for site investigations, survey work, CAD work, and data collection		✓				

Job Duty	Entry	Mid	Senior	Dis Spec	Sup	Mgr
Prepares, provides training, provides guidance, and reviews engineering designs and reports which include design calculations and plan preparation		✓				
Performs, trains, and guides on quality assurance to ensure that projects are carried out as designed and recommends additions as needed		✓				
Performs, trains, oversees, and provides guidance for site investigations, survey work, CAD work, and data collection			✓			
Prepares, provides training and guidance, oversees, and reviews engineering designs and reports, including design calculations and plan preparation			✓			
Performs, trains, oversees, and guides on quality assurance to ensure that projects get carried out as designed and recommend additions as needed			✓			
Provides discipline-specific technical leadership for planning and data collection				✓		
Provides technical leadership for engineering analysis and design				✓		

Job Duty	Entry	Mid	Senior	Dis Spec	Sup	Mgr
Provides discipline-specific technical leadership for quality assurance				✓		
Performs and supervises the individuals performing site investigations, survey work, CAD work, and data collection					✓	
Performs and supervises the individuals creating engineering designs and reports, which includes design calculations and plan preparation					✓	
Performs and supervises the individuals performing quality assurance ensuring projects get carried out as designed; and recommend additions as needed					✓	
Directs and leads the technical program						✓
Finalizes and issues technical policies and procedures in accordance with Agency priorities						✓
Manages resources, dollars, and people to meet Agency priorities						✓

Foundational Competencies – Agricultural Engineer

These are the top foundational competencies of the job, applicable at all Career Levels. The set of top foundational competencies and associated proficiency levels should differentiate the job from other jobs within and across the career groups. Proficiency Rating Definitions are included in the appendix. This list includes the top competencies.

**Table 34. Foundational Competencies –
Agricultural Engineer**

Foundational Competency	Proficiency Rating					
	Entry	Mid	Senior	Dis Spec	Sup	Mgr
1. Representing the Agency	1	3	4	4	5	5
2. Initiative	2	3	4	4	5	5
3. Problem Solving	2	3	4	4	4	5

Recommended Foundational Experience – Agricultural Engineer

These are the top experiences (e.g., stretch assignments), based on the Foundational Competencies, an individual can participate in to prepare to be a viable candidate for the job.

**Table 35. Recommended Foundational Experience –
Agricultural Engineer**

Foundational Competency	Career Level	Foundational Experience
Representing the Agency	Entry	Appropriately supports the Agency's goals in interactions with others
		Maintains professional attitude and actions in all business situations
		Develops knowledge of relevant policies, rules, and procedures for representing the Agency (e.g., standards of conduct) and follows them accordingly
	Mid	Takes effective steps to resolve confrontational situations with customers in a manner that reflects positively on the Agency
		Promotes the Agency in a professional manner that educates others, protects its interests, and enhances its image and reputation
		Represents the Agency as a professional expert on natural resource conservation issues (e.g., presents a technical paper at a conference)
	Dis Spec	Serves as a role model and advises others on presenting a professional image of the Agency to enhance trust and credibility
		Engages with others in a manner that earns their respect and advances the goals and objectives of the Agency
		Serves as an Agency representative on interagency teams and projects
		Represents the Agency's interests to a variety of parties (e.g., at technical group meetings, to universities)

Foundational Competency	Career Level	Foundational Experience
	Sup	Manages complex and difficult situations with confidence and decisiveness, enhancing the reputation and image of the Agency
		Meets with elected or appointed officials to provide Agency and program information for decision-making
		Promotes and justifies the Agency's programs and actions in contentious situations
		Markets the Agency's mission and programs through media outlets
	Mgr	Manages complex and difficult situations with confidence and decisiveness, enhancing the reputation and image of the Agency
		Meets with elected or appointed officials to provide Agency and program information for decision-making
		Promotes and justifies the Agency's programs and actions in contentious situations

Foundational Competency	Career Level	Foundational Experience
Initiative	Entry	Seeks out new responsibilities, assignments, and opportunities
		Asks coworkers, peers, and supervisors questions to better understand work requirements and needs of customers
		Participates in a mentoring relationship as a protégé
	Mid	Seeks out more challenging responsibilities, such as managing projects
		Volunteers to take the lead on team efforts outside of one's normal job duties
		Takes the initiative to develop tools/instructions to share with coworkers (e.g., developing standard operating procedures for a specific area)
		Participates in a mentoring relationship to assist in the development of less-experienced staff
	Dis Spec	Volunteers to take the lead on state-wide efforts that do not fit within one's normal comfort zone or job duties, such as developing training
		Identifies and implements solutions for improving the efficiency and effectiveness of established work processes
		Volunteers for a challenging detail that is outside the normal scope of duties
		Volunteers/offers to serve as a member of a special committee or focus group that has Agency-wide impact
	Sup	Puts in a sustained and intense effort to accomplish highly complex and/or critical tasks and or goals
		Volunteers for long-term special assignment or detail that will have an impact on the Agency and its mission
		Identifies major problems or issues and recommends solutions that have the potential to significantly impact and improve the Agency
		Establishes a climate for the state or Agency that encourages new ideas and initiative
	Mgr	Puts in a sustained and intense effort to accomplish highly complex and/or critical tasks and or goals
		Volunteers for long-term special assignment or detail that will have an impact on the Agency and its mission
		Identifies major problems or issues and recommends solutions that have the potential to significantly impact and improve the Agency

Foundational Competency	Career Level	Foundational Experience
Problem Solving	Entry	Establishes a climate for the state or Agency that encourages new ideas and initiative
		Applies proven solutions, strategies, and/or procedures to solve problems
		Determines cause of a customer problem and takes approved, corrective action
		Identifies problems, considers available information, and evaluates alternative solutions to problems affecting own work
	Mid	Reconciles conflicting and/or incomplete information to develop solutions
		Uses data and information to identify relationships, issues, assumptions, and emerging trends and draws sound conclusions
		Solves problems by thoroughly analyzing their causes and short- and long-term implications of solutions
		Anticipates potential problems and takes or proposes corrective actions
	Dis Spec/ Sup/	Identifies and leverages resources and expertise, internal or external to the work unit, to address complex problems
		Synthesizes information from internal and external sources to develop an action plan addressing complex issues (e.g., applying information from NHQ to State problem; updating guidelines with new technologies)
		Identifies connections between seemingly unrelated pieces of information to resolve difficult or ambiguous problems
	Mgr	Improves efficiency by developing, planning, and implementing multi-tier solutions to address highly complex or unprecedented problems
		Resolves problems of particular difficulty, sensitivity, or strategic importance
		Identifies and resolves subtle issues and/or trends and their causes across organizational groups

Leadership Competencies

These are the top leadership competencies of the job, applicable at all Career Levels. The set of leadership competencies and associated proficiency levels should differentiate the job from other jobs within and across the career groups. Proficiency Rating Definitions are included in the appendix. This list includes the top competencies.

**Table 36. Leadership Competencies –
Agricultural Engineer**

Leadership Competency	Proficiency Rating					
	Entry	Mid	Senior	Dis Spec	Sup	Mgr
1. Fiscal Responsibility	NA	NA	1	1	1	5
2. Assigning, Evaluating, and Monitoring Work	NA	NA	1	1	1	5
3. Developing Others	NA	NA	1	1	2	5
4. Human Resource Management	NA	NA	1	1	1	5
5. Team Building	NA	NA	2	2	3	5
6. External Awareness	NA	NA	1	1	2	5
7. Relationship Management	1	2	4	4	5	5
8. Leveraging Diversity	NA	NA	1	1	1	5
9. Public Service Motivation	NA	NA	1	1	2	5
10. Political Savvy	NA	NA	1	1	1	5
11. Vision	NA	NA	1	1	1	5
12. Strategic Thinking and Action	NA	NA	1	1	1	5

Recommended Leadership Experience – Agricultural Engineer

These are the top experiences (e.g., stretch assignments), based on the Leadership Competencies, an individual can participate in to prepare to be a viable candidate for the job.

**Table 37. Recommended Leadership Experience –
Agricultural Engineer**

Leadership Competency	Career Level	Leadership Experience
Fiscal Responsibility	Sr/Dis Spec/ Sup	Develops understanding of the Agency's basic financial processes and policies
		Manages a limited, specified amount of financial resources
		Assists others with the budgeting of resources by providing estimates of own projects and needs
	Mgr	Understands appropriation laws and demonstrates a mastery of the financial processes of the Agency
		Identifies financial resources available internal and external to the Agency, and skillfully gains access to these resources
		Establishes systems to monitor expenditures within the Agency to ensure that financial resources are effectively allocated to achieve the objectives of the Agency

Leadership Competency	Career Level	Leadership Experience
Assigning, Evaluating, and Monitoring Work	Sr/Dis Spec/ Sup	Establishes and clearly communicates work expectations to employees
		Assigns work in a fair and equitable manner
	Mgr	Adjusts work activities to ensure seamless integration and effectiveness across work units during periods of rapid change in the operating environment and/or when working with narrow windows of time
		Establishes and clearly communicates expectations that are linked to unit objectives and the Agency's mission to unit leaders engaged in highly complex work activities
		Coordinates and monitors performance on complex programs (e.g., special initiatives) across partners to meet both organizational and unit objectives
Developing Others	Sr/Dis Spec	Provides feedback in a constructive manner
		Aids employees in identifying developmental opportunities
		Encourages others to achieve high standards and perform beyond set expectations
		Involves staff in developing project goals and timelines
	Sup	Trains, coaches, or mentors employees
		Sets clear goals and developmental milestones for employees
		Sets example regarding high performance standards for the unit or team
	Mgr	Identifies creative developmental strategies to address skill needs of workforce
		Sets an example and guides others across the Agency to be skillful trainers, coaches, and mentors
		Establishes or promotes a culture around getting others to maximize their potential

Leadership Competency	Career Level	Leadership Experience
Human Resource Management	Sr/Dis Spec	Provides input on what staff is required, recruitment ideas, and training opportunities
		Reports fraudulent activities in accordance with HR policies
		Addresses employee performance and conduct problems in a timely manner
		Develops/creates performance appraisals within suggested timeline
	Sup	Provides input on what staff is required, recruitment ideas, and training opportunities
		Reports fraudulent activities in accordance with HR policies
		Addresses employee performance and conduct problems in a timely manner
	Mgr	Assess current and emerging priorities, performance information, and employee goals to identify both immediate and long-term organizational needs; ensures individuals receive necessary training to meet these needs
		Anticipates skill needs that are consistent with organizational trends and changing priorities; identifies creative recruitment strategies to address these needs

Leadership Competency	Career Level	Leadership Experience
Team Building	Sr/Dis Spec	Is proactive in recognizing when help is needed and provides assistance to help the team in accomplishing goals
		Independently offers assistance and provides support to advance goals
		Clearly articulates team goals and objectives to team members and explains why they are on the team
	Sup	Integrates new team members into structure and assists them in transitioning to role
		Understands team dynamics and uses knowledge to motivate team members
		Gains support and buy-in throughout product/project development to gain support for product/project throughout the Agency
	Mgr	Champions initiatives, leverages opportunities, and minimize obstacles, thereby easing the path to achieving different units' goals
		Leads a team to resolve challenging or controversial Agency-wide legislative and regulatory policy issues
		Recognizes effective teams and integrates best practices
		Inspires teams to achieve success

Leadership Competency	Career Level	Leadership Experience
External Awareness	Sr/Dis Spec	Maintains awareness and evaluates the impact of external events on current processes
		Responds to environmental, budgetary, political, or other events and circumstances requiring change
		Effectively alters plans and redistributes resources to address changing requirements
	Sup	Consults with leadership regarding the impact of how external factors may affect the Agency
		Considers external policies and trends when reviewing correspondence, reports, and policy documents
		Gathers and summarizes information to predict stakeholder views on a new policy
	Mgr	Demonstrates an in-depth understanding of external factors that may affect the Agency's work and uses this knowledge constructively in establishing goals and priorities and accomplishing work
		Anticipates how work processes may be affected by changes in the external environment or events and, in response, develops creative and highly effective alternatives
		Develops programs or initiatives (e.g., WHIP, ecological site descriptions) taking into account the diverse views and needs of other agencies or external organizations

Leadership Competency	Career Level	Leadership Experience
Relationship Management	Entry	Develops a basic knowledge of what organizations, agencies, or groups NRCS partners with (i.e., FSA, Soil and Water Conservation Districts).
		Identifies individuals or groups whose input would improve or facilitate one's own task accomplishment
	Mid	Works with individuals across work units to address mutual issues and concerns
		Builds a network within the Agency by proactively communicating with employees outside of own work unit on a regular basis
		Coordinates with internal and external partners and customers regarding new strategies to ensure effective coordination
	Sr/Dis Spec	Partners with various groups by sharing information and resources across multiple organizational levels, including updates/changes
		Identifies new and/or non-traditional partners and new ways to develop relationships with partners that will have a positive impact on Agency goals
		Develops and manages relationships with national leadership to gain endorsement for initiatives and help achieve common goals
	Sup/Mgr	Initiates, develops, publicizes, and garners support for programs and policies by meeting with partners, stakeholders, employees, customers, and other interested parties
		Works across Federal, state, and local agencies/authorities to coordinate conservation efforts (e.g., cooperative agreements, coordinating the EWP program)
		Establishes long-lasting relationships with non-traditional partners to develop relationships that will have a positive impact on Agency goals

Leadership Competency	Career Level	Leadership Experience
Leveraging Diversity	Sr/Dis Spec/ Sup	Adheres to EEO policies, goals, objectives, and philosophies by dealing with everyone fairly, equitably, and professionally
		Demonstrates knowledge of Agency policy in regard to diversity
		Meets with staff to obtain input on diversity issues within workgroup
		Develops an awareness of situations which could potentially lead to allegations of harassment or discrimination
	Mgr	Establishes rules and practices to ensure diversity and collaboration within the Agency; works with the different unit leaders to effectively leverage diverse thought, opinions, experiences, and backgrounds to achieve the vision and mission of the Agency
		Actively promotes NRCS diversity programs and initiatives, highlighting the Agency's commitment to diversity and its value to the organization; facilitates participation in diversity-related programs and initiatives
		Proactively monitors the workplace to identify situations which could potentially lead to allegations of harassment or discrimination, and establishes practices/creates an environment to prevent such situations

Leadership Competency	Career Level	Leadership Experience
Political Savvy	Sr/Dis Spec/ Sup	Considers impact when addressing employee expectations (e.g., working with union, relocations)
		Considers staff concerns or feedback regarding organizational changes
		Demonstrates knowledge of stakeholders and peers/leaders in the Agency
	Mgr	Leads change in the Agency by meeting with stakeholders to understand perspectives and reach consensus on Agency-wide plan to implement change
		Establishes relationships with diverse organizational interests to effectively communicate priorities, build organizational credibility, and generate external support
		Identifies and coordinates multiple parties to reach a common goal; educates these parties on how their participation and coordination will lead to goal accomplishments
		Addresses controversial issues and gains buy-in with resistant individuals
Strategic Action and Thinking	Sr/Dis Spec/ Sup	Organizes project team based on consideration of strategic objectives
		Ensures team objectives are consistent with strategic plan
	Mgr	Anticipates changes (e.g., a demographic change, policy change) and establishes a plan to address the future needs of the Agency
		Designs approaches and procedures to develop a strategic plan supporting key goals and objectives
		Leads and directs a diverse strategic planning team tasked with addressing and outlining the future direction of the Agency

Leadership Competency	Career Level	Leadership Experience
Public Service Motivation	Sr/Dis Spec	Responds promptly and accurately to public inquiries
		Suggests gaining feedback from public (e.g., regarding new policy, procedure, priorities)
		Listens to the public to understand community concerns and public needs
	Sup	Reviews policies and procedures on a regular basis to ensure they are consistent with public needs
		Determines community needs by talking to citizens or conducting focus groups
		Ensures employees receive recognition for public service (e.g., nominates employees for formal acknowledgment or award)
	Mgr	Designs and develops programs and initiatives to address critical public requirements
		Works with policy and regulation developers to modify policy/regulation to better serve public
		Establishes a culture for public service motivation and commitment to the public good
		Instills a sense of public service in employees
Vision	Sr/ Dis Spec/ Sup	Gathers input from staff to develop work group vision
		Demonstrates knowledge of Agency vision and mission
		Develops and generates support for work group vision
		Understands Agency long-term goals and objectives
	Mgr	Formulates short- and long-term strategies across organizational units that take a broad perspective and achieve significant results in support of organizational goals
		Communicates a vision by translating broad organizational goals into well-defined strategies, plans, priorities, and assignments
		Considers various viewpoints from internal and external sources when developing new organizational mission and vision

Occupational Competencies – Agricultural Engineer

These are the occupational competencies of the job, applicable at all Career Levels. These should differentiate the job from other jobs within and across the career groups. Proficiency Rating Definitions are included in the appendix. This list includes all of the occupational competencies associated with the Agricultural Engineer job.

**Table 38. Occupational Competencies –
Agricultural Engineer**

Occupational Competency	Proficiency Rating					
	Entry	Mid	Senior	Dis Spec	Sup	Mgr
1. Problem Identification/ Defining Objectives	1	3	4	5	5	5
2. Development of Alternatives – Decision Support	1	3	4	5	5	5
3. Data Collection and Analyses	2	3	4	5	5	5
4. Design	1	3	4	5	5	5
5. Quality Assurance	2	3	4	5	5	5
6. Agricultural and Biological Engineering	1	3	4	5	5	5

Recommended Occupational Experience – Agricultural Engineer

These are the top experiences (e.g., stretch assignments), based on the Occupational Competencies, an individual can participate in to prepare to be a viable candidate for the job.

**Table 39. Recommended Occupational Experience –
Agricultural Engineer**

Occupational Competency	Career Level	Occupational Experience
Problem Identification/ Defining Objectives	Entry	Develops awareness of common types of issues/concerns in local area
		Develops an understanding of appropriate questions to ask the customer
		Assists in analyzing situation to identify basic issues/concerns
		Assists in documenting client needs to review with supervisor and/or others
	Mid	Independently works with customers to determine resource objectives and/or needs and engages them in the conservation planning process
		Identifies situations requiring subject-matter experts (e.g., biologists, engineers, etc.) regarding specific resource concerns
		Works on multidisciplinary teams to address routine resource concerns
		Trains others on how to effectively identify and address natural resource concerns
	Sr	Develops materials and trains others on how to effectively identify and address non-routine/complex natural resource concerns
		Provides assessments for a wide array of diverse issues/concerns
		Works independently with State/Federal/Tribal agencies, conservation partners, and/or other stakeholders

Occupational Competency	Career Level	Occupational Experience
	Dis Spec/ Sup/ Mgr	Identifies the need and coordinates development of training at the National/Regional/State levels
		Development of National/State level policies and procedures in order to carry out problem identification
		Works with customers to determine requirements for unique or complex projects, including those projects that are extensively regulated or high impact/visibility

Occupational Competency	Career Level	Occupational Experience
Development of Alternatives – Decision Support	Entry	Under close supervision, develops an awareness of different engineering alternatives commonly used in their service area
		Under supervision, becomes familiarized with the Conservation Practice Physical Effects document
		Under close supervision, interacts with customers
	Mid	Independently reviews and evaluates investigative data to formulate alternatives that meet resource concerns
		Independently advises customers (internal and external) on problems and alternative solutions and provides technical and planning assistance
		Independently develops preliminary designs for routine situations
	Sr	Provides advice and guidance to employees on the selection of complex engineering practices
		Proposes the use of innovative engineering practices
		Works with others (e.g., non-governmental organizations, commodity groups, other government agencies) to assist landowners in evaluating and planning complex engineering practices
		Develops alternatives and preliminary designs for a wide array of diverse issues/concerns
	Dis Spec/ Sup/ Mgr	Engages multiple stakeholders in planning alternative solutions for unique or complex projects, including those projects that are extensively regulated or high impact/visibility
		Works with national and international organizations (e.g., universities, professional groups, other government agencies) to develop alternatives to solve resource concerns
		Identifies the need and coordinates development of training at the National/Regional/State levels
		Provides direction and guidance for the development of innovative alternatives

Occupational Competency	Career Level	Occupational Experience
Data Collection and Analyses	Entry	Collects and analyzes data for basic engineering projects or processes
		Identifies applicability of existing data for use in performing analyses
		With limited supervision, collects basic data on routine sites and carries out required analyses
		Independently uses basic surveying instruments to gather survey data
		Assist in preparing comprehensive data analysis reports
	Mid	Plans, collects, and analyzes the required data for a field investigation and as required throughout each phase of a routine project
		Independently prepares comprehensive data analysis reports
		Recognizes the need and requests specialized assistance (e.g., geologist, or soil scientist) for data collection in more complex sites
		Provides basic training on data collection and analyses methodologies
	Sr	Develops materials and trains others on data collection/analyses methods and techniques
		Recommends and integrates more advanced technologies, software, and equipment for use in data collection and analyses
		Develops innovative data collection techniques and analyses to tackle unique and/or complex engineering problems
	Dis Spec/ Sup/ Mgr	Identifies the need and coordinates development of training at the National/Regional/State levels
		Develops National/Regional/State level policies and procedures on data collection and analyses
		Represents NRCS in expert panels, interagency working groups, etc. in reviewing new technologies, equipment, or methods

Occupational Competency	Career Level	Occupational Experience
Design	Entry	Under close supervision, develops an awareness of the NRCS design process and related skills for practices commonly used in their service area
		Under close supervision, develops an awareness of conservation practice standards, and construction and materials specifications
		Under close supervision, performs components of basic designs
	Mid	Independently develops designs and supporting documentation for a variety of routine projects
		Performs reviews of designs developed by others for routine practices
		Provides training on routine practice component design to others
		Provides advice and guidance for design interpretation and makes modifications as necessary during the construction phase for routine projects
	Sr	Develops materials and trains others on a variety of non-routine/complex practice designs
		Independently develops designs and supporting documentation for complex practices
		Provides advice and guidance for design interpretation and makes modifications as necessary during the construction phase for complex projects
		Performs reviews of designs for complex projects
	Dis Spec/ Sup/ Mgr	Identifies the need and coordinates development of training at the National/Regional/State levels
		Develops National/Regional/State level policies and procedures on design preparation and review
		Creates innovative standards, design procedures, and construction specifications where none exist
		Performs reviews of designs for the most complex or high impact/visibility projects

Occupational Competency	Career Level	Occupational Experience
Quality Assurance	Entry	With limited supervision, performs all phases of a Construction Quality Assurance plan for a routine practice
		Assists in the development of reports to summarize results of quality assurance reviews
		Assists in conducting spot checks on routine engineering practices
	Mid	Independently performs all phases of a Construction Quality Assurance plan for all practices
		Independently conducts spot checks on routine practices
		Independently generates comprehensive Quality Assurance reports
		Provides recommendations on management and corrective actions that may be needed
		Provides basic training to others on the quality assurance process
		Serves as contracting officer's technical representative (COTR) on routine projects
	Sr	Provides evaluation assessments and recommends corrective actions for improvement for complex projects and/or complex design issues
		Independently carries out spot checks on complex engineering practices
		Provides comprehensive Quality Assurance reports for complex projects and/or quality assurance issues
		Develops materials and trains others on NRCS policies and procedures with regard to quality assurance processes
	Dis Spec/ Sup/ Mgr	Identifies the need and coordinates development of training at the National/Regional/State levels
		Develops National/Regional/State level policies and procedures on quality assurance
		Utilizes results from existing reviews to make modifications to policies and standards
		Integrates innovative knowledge and technology from other fields and disciplines to improve quality assurance policies and procedures
		Develops policies and procedures to conduct quality assurance reviews of

Occupational Competency	Career Level	Occupational Experience
		new materials and technologies
Agricultural and Biological Engineering	Entry	Develops an awareness of the development and implementation of engineering practices (e.g., waste storage and treatment, irrigation and drainage, erosion control)
		Develops an awareness of the requirements of local, state, and federal regulations
		Develops an awareness of the appropriate use of engineering tools to plan, analyze, and design routine systems of engineering practices
	Mid	Develops solutions for routine systems of engineering practices (e.g., waste storage and treatment, irrigation and drainage, erosion control, energy conservation and production)
		Independently understands and ensures compliance with local, state, and federal regulations relating to systems of engineering practices
		Independently utilizes full range of engineering tools to plan, analyze, and design routine systems of engineering practices
	Sr	Develops State supplements to internal reference materials
		Provides guidance and assistance for the development and implementation of complex systems of engineering practices (e.g., waste storage and treatment, irrigation and drainage, erosion control, energy conservation and production)
		Provides guidance and leadership in the development or revision of interim and state conservation practice standards
	Dis Spec/ Sup/ Mgr	Provides oversight in the development and/or revision of internal engineering directives and tools to plan, analyze, and design systems of engineering practices
		Serves on expert panels that develop external reference materials
		Advises Federal, Tribal, and State regulators in the development and implementation of regulations affecting systems of engineering practices
		Represents agricultural and biological engineering discipline on internal and external multidisciplinary teams

Recommended Education/Certifications – Agricultural Engineer

These are the recommended education/certification requirements to attain each level of the Agricultural Engineering job. These recommendations are based on Office of Personnel Management (OPM) guidelines as well as Subject Matter Expert recommendations.

**Table 40. Recommended Education and Certifications –
Agricultural Engineer**

Education/Certifications	Career Level					
	Entry	Mid	Senior	Dis Spec	Sup	Mgr
1. Completion of a 4-year degree in engineering accredited by the Accreditation Board for Engineering and Technology as a professional engineering curriculum; or including differential and integral calculus and courses in 5 of the following areas: statics, dynamics, strength of materials, fluid mechanics, hydraulics, thermodynamics, electrical fields and circuits, and properties of materials	✓	✓	✓	✓	✓	✓
2. 1 year of graduate-level education or superior academic achievement in a related field*	✓	✓	✓	✓	✓	✓

* Indicates educational recommendations not required for the position which can be used for individuals wishing to enter the job series above Entry level.

Professional Associations – Agricultural Engineer

These seven professional associations are recommended as resources for individuals interested in the Agricultural Engineer job.

**Table 41. Professional Associations –
Agricultural Engineer**

American Society of Agricultural and Biological Engineers
American Water Works Association
American Water Resources Association
International Erosion Control Association
Irrigation Association
The Soil and Water Conservation Society
National Society of Professional Engineers

Appendix

Job Level Definitions

You will see “Entry,” “Mid,” “Sr,” “Dis Spec,” “Spv,” and “Mgr” career levels along with the necessary proficiency ratings for each of these levels. The table below explains the differences between each of the five possible career levels. Specifically, it provides an overview of each job level, followed by a high level description of the experience/knowledge associated with the job level, the type of duties they perform at that job level, and the supervisory responsibilities at that job level.

	Entry	Mid	Senior/ Technical	Discipline Specialist	Supervisor	Manager
Overview	Starting level of a career. Consists of individuals entering a field of work for the first time, as well as those still early in their career.	Full performance level. Individuals at this level are skilled enough to be independent contributors.	Advanced performance level. Individuals have enhanced technical knowledge or skills in a field.	Advanced performance level. Individuals have enhanced technical knowledge or skills in a field. Apply these knowledge/skills at a regional/national level.	First-line supervisory level. These individuals supervise non-supervisors.	Advanced supervisory level. These individuals typically direct the work of an organizational unit, (including supervising supervisors) and are held accountable for the unit's progress.

	Entry	Mid	Senior/ Technical	Discipline Specialist	Supervisor	Manager
Experience/ Knowledge	Minimal work experience in the area and foundational knowledge to begin a career in the field.	Sufficient work experience and knowledge in the area to perform all core functions of the job.	Sufficient work experience and technical knowledge to be considered a subject matter expert in the field.	Sufficient work experience and technical knowledge to be considered a subject matter expert in the field from a regional/ national perspective.	Sufficient work experience and knowledge in the area and organization to directly oversee the work of others.	Sufficient work experience and knowledge in the area and organization to direct the work of an organizational unit.
Duties	Performs basic position duties often under close supervision.	Performs the key duties of the position independently with little supervision.	Performs advanced position duties that may be based on: <ul style="list-style-type: none"> • Enhanced technical knowledge or skills in a field. • Extensive non-supervisory administrative responsibilities. 	Performs advanced position duties at the regional/ national level that may be based on: <ul style="list-style-type: none"> • Enhanced technical knowledge or skills in a field • Extensive non-supervisory administrative 	Performs first-line supervisory duties (e.g., supervising employees, performance appraisals and leave approvals).	Performs managerial duties such as managing work plans, schedules, and resources in order to meet organizational objectives.

				responsibili- ties		
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	Entry	Mid	Senior/ Technical	Discipline Specialist	Supervisor	Manager
Supervisor Responsibilities	None	None	None	None	Supervision of some employees, but does not supervise other supervisors.	Supervision of other supervisors.

Proficiency Scale Definitions

We prepopulated the necessary proficiency ratings for each career level based on the competency models and proficiency ratings that you developed. The proficiency scale is a 5-point scale that is used to suggest how knowledgeable individuals should be on a particular competency:

1 – Basic

- Applies the competency in the simplest situations
- Requires close and extensive guidance
- Demonstrates awareness of concepts and processes

2 – Foundational

- Applies the competency in somewhat difficult situations
- Requires frequent guidance
- Demonstrates familiarity with concepts and processes

3 – Intermediate

- Applies the competency in difficult situations
- Requires occasional guidance
- Demonstrates understanding of concepts and processes

4 – Advanced

- Applies the competency in considerably difficult situations
- Generally requires little or no guidance
- Demonstrates broad understanding of concepts and processes

5 – Expert

- Applies the competency in exceptionally difficult situations
- Serves as a key resource and advises others
- Demonstrates comprehensive, expert understanding of concepts and processes